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Patent App. SN: 10/627,442
Attorney Docket No. 22001

REMARKS

In the Office Action mailed August 8, 2006 (hereinafter, the "Office Action"), Claims 1-17 were pending for consideration. Claims 1 has been amended and Claims 21-30 are withdrawn from consideration. Of the pending claims, Claims 1-17 have been rejected as allegedly obvious under 35 U.S.C. 103(a) over nine different references, individually and in various combinations.

By the present amendment, Claim 1 has been amended to specify that nanodiamond is the only form of diamond present, and further that the mass is free of residual catalyst. Support for such amendments may be found in the originally filed Claims 1, 2, 3, and 4 as well as in the originally filed specification in the following locations: pg. 7, lines 6-18; pg. 8, lines 9-20; and pg. 9, lines 13-22. Accordingly, Applicant respectfully submits that no new matter is added by this amendment. Furthermore, it is to be understood that such amendments are made solely for the purpose of expediting prosecution of the present matter and without conceding the correctness of the present rejections and without prejudice to Applicant's right to pursue relinquished subject matter in a future patent application. Applicant believes that pending Claims 1-17 present allowable subject matter, and reconsideration and allowance thereof is respectfully requested.

Rejections Under 35 U.S.C. § 103(a)

Claims 1-17 were pending for consideration in the Office Action. All of these claims were rejected as allegedly obvious under 35 U.S.C. § 103(a) over a number of references and combinations of references. Specifically;

- (a) Claims 1-10 and 16-17 were rejected as allegedly obvious over Akashi et al.,
- (b) Claims 1-17 were rejected as allegedly obvious over Phaal et al.,

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- (c) Claims 1-17 were rejected as allegedly obvious over Wentorf, Jr. et al.,
- (d) Claims 1, 3-4, 6-10 and 16-17 were rejected as allegedly obvious over Sumiya et al.,
- (e) Claims 1, 3-4, 6-11 and 15-17 were rejected as allegedly obvious over Yoshida et al.,
- (f) Claims 1-4, 6, 10-11 and 15-17 were rejected as allegedly obvious over Nakai et al.,
- (g) Claims 1-10 and 16-17 were rejected as allegedly obvious over JP 2-30667,
- (h) Claims 1-11 and 15-17 were rejected as allegedly obvious over Cerutti,
- (i) Claims 1-17 were rejected as allegedly obvious over Hall et al.,
- (j) Claims 11 and 15 were rejected as allegedly obvious over Akashi et al., applied to Claim 1 and in view of Cerutti,
- (k) Claims 11 and 15 were rejected as allegedly obvious over JP 2-30667 applied to Claim 1 and in view of Cerutti,
- (l) Claims 11 and 15 are rejected as allegedly obvious over Sumiya et al. applied to Claim 1 and in view of Cerutti, and
- (m) Claims 12-14 were rejected as obvious over either (1) Cerutti as applied to Claim 11, (2) Akashi et al. in view of Cerutti as applied to Claim 11 (3) JP 2-30667 in view of Cerutti as applied to Claim 11, (4) Sumiya et al. in view of Cerutti as applied to Claim 11 above, or (5) Yoshida et al. as applied to Claim 11 above all in view of Phaal et al. and Wentorf, Jr. et al.

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Applicant respectfully submits that the rejected claims are patentable over the cited references for the reasons set forth below, and requests that the rejections be withdrawn.

As with the prior correspondence, before discussing the § 103 rejections, it is thought proper to briefly state what is required to sustain such a rejection. The issue under § 103 is whether the PTO has stated a case of *prima facie* obviousness. "The PTO has the burden under § 103 to establish a *prima facie* case of obviousness." *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). To satisfy this burden, the PTO must meet the criteria set out in M.P.E.P. § 706.02(j):

... three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaack*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991).

With the above background in mind, the rejections under 35 U.S.C. § 103 will be discussed. Applicant contends that the PTO has failed to make a *prima facie* case of obviousness in that in view of the presently amended Claim 1, the references fail to teach or suggest all of the claim limitations, either individually, or in any combination, or by any other asserted modification thereof.

Discussion

The following discussion is directed to the issues raised as pertinent to the independent claim of the application. It is recognized that the issues raised by the Examiner pertaining only to dependent claims are addressed by discussions regarding the independent claims, as they are in this case rendered moot if the independent claim(s) are found allowable. The dependent claims are narrower in scope than the independent claims from which they depend, and in the present

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circumstances are patentable if the independent claim(s) are patentable.

Phaal et al., Wentorf, Jr. et al., Sumiya et al., Yoshida et al., and Nakai et al., Cerutti, and Hall

The Examiner has conceded that the masses of the Phaal et al., Wentorf, Jr. et al., Cerutti, and Hall references would contain a small amount of catalyst. See Office Action, pg. 7, lines 7-11. Furthermore, the Examiner has conceded that the Sumiya et al., Yoshida et al., and Nakai et al references contain a catalyst or sintering aid. See Office Action, pg. 7, lines 12 and 17; and pg. 8, line 1. As Claim 1 has been amended to specifically require that the mass be free of residual catalyst, Applicant believes the rejections based on the noted references to be moot. Therefore, Applicant respectfully requests that the rejections based on Phaal et al., Wentorf, Jr. et al., Sumiya et al., Yoshida et al., and Nakai et al., Cerutti, and Hall be withdrawn.

JP 2-30667

The Examiner has rejected Claims 1-10 and 16-17 as allegedly obvious over JP 2-30667. This reference does not teach or suggest all of the limitations set forth in Claim 1, particularly in light of the present amendment. Specifically, the JP 2-30667 reference does not teach or suggest a sintered mass containing nanodiamond as the only form of diamond in the article and that as the only form of diamond, the nanodiamond accounts for 95% by volume of the article. The JP 2-30677 reference appears to teach tri-modal packing of diamond particles. The first part of the included diamond content is a mixture of 5-95 vol% polycrystalline diamond powder having 10-100 nm diameter particle size and 95-5 vol% diamond powder with particle size of 100 nm to 50 μ m. Very clearly, this first part contains a non-nanodiamond portion. Next, this first part is mixed with a

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second part which is diamond powder with a 1-10 μm diameter. This second portion also clearly includes non-nanodiamond. Accordingly, this reference, nor any suggested modification thereof fails to teach or suggest all of the claim limitations. In view of the foregoing, the present invention is not obvious in light of the JP reference and the rejection based thereon should be withdrawn.

Akashi et al.

The Examiner rejected Claims 1-10 and 16-17 as allegedly obvious over Akashi et al. As was attested to in the previously-attached affidavit of Dr. Cho, this reference fails to teach nanodiamond. The Examiner points to Akashi's preferable diamond particle size of "between 0 grade and 1000 grade." See col. 7, lines 28-30. This is conventional terminology for micron size diamonds. In particular, "0 grade" refers to a fine grade of micron diamond, typically about 1-2 micron in size. Even the Akashi reference itself reads on this interpretation. In fact, all other uses of the term "grade" in Akashi are immediately preceded by the term " μm ". See e.g. col. 6, lines 5, 10-11, 16-17, 23, 33; col. 13, lines 31-32; and col. 14, line 40. Additionally, all of the examples presented in Akashi involve particle size in the micron range. Interpreting the reference on its face, then, would lead one to the conclusion that "between 0 grade and 1000 grade" is 0 to 1000 μm . Furthermore, 0 μm is not by any means nanodiamond. 0 μm may be interpreted to be just under 1 μm , or even 0.9 μm , which are not the claimed nanodiamond particles. In light of the reference failing to teach the nanodiamond of the present invention, Applicant submits that a *prima facie* case of obviousness has not been presented. As such Applicant requests that the rejection based on Akashi be withdrawn.

Combination rejections: Akashi et al. Claims 11 and 15 as applied to Claim 1 and in view of Cerutti; JP 2-30667 applied to Claim 1 and in view of Cerutti; Sumiya et al.

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applied to Claim 1 and in view of Cerutti; and (1) Cerutti as applied to claim 11, (2) Akashi et al. in view of Cerutti as applied to claim 11 (3) JP 2-30667 in view of Cerutti as applied to claim 11, (4) Sumiya et al. in view of Cerutti as applied to claim 11 above, or (5) Yoshida et al. as applied to claim 11 above all in view of Phaal et al. and Wentorf, Jr. et al.

Applicant respectfully submits that none of the cited references, either alone or in combination, teach each and every element of the claimed invention. Particularly, all of the rejections are based on a combination including Cerutti or Yoshida. As discussed earlier, both references clearly contain residual catalyst. Furthermore, regarding the rejections of Claims 12-14 specifically, all of the combinations are taken in view of Phaal et al. and Wentorf, Jr. et al. As was discussed earlier, both of these references also contain residual catalyst. Furthermore, none of the references alone or in combination teaches a sintered nanodiamond mass free of the diamond form of carbon. In light of the above comments, Applicant respectfully submits the art cited in the Office Action fails to teach or suggest each of the elements of the claimed invention, particularly in light of the present amendments. As such, the third element of the *prima facie* case necessary to support a §103 rejection was not established in the Office Action. Accordingly, Applicant respectfully requests that the above rejection be withdrawn.

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In view of the foregoing, Applicant believes that presently pending Claims 1- 17 present allowable subject matter and allowance is respectfully requested. If any impediment to the allowance of these claims remains after consideration of the above remarks, and such impediment could be resolved during a telephone interview, the Examiner is invited to telephone the undersigned attorney at (801) 566-6633, to address such issues as expeditiously as possible.

The Commissioner is hereby authorized to charge any additional fee or to credit any overpayment in connection with this Amendment to Deposit Account No. 20-0100.

Dated this 3rd day of November, 2006.

Respectfully submitted,



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